

TRIAXIAL SUPERDEFORMED BANDS IN ^{175}Hf

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A new triaxial superdeformed (TSD) band has been observed in ^{175}Hf with the GAMMASPHERE spectrometer and the $^{130}\text{Te}(^{48}\text{Ca}, 3n)$ reaction at 194 MeV. This TSD band is directly connected to a new highly deformed band which has been linked into the known level scheme [1][2]. These data provide, for the first time, spin determination for a TSD band in a Hf nucleus and represent the highest spins observed to date in this region. The large alignment gain ($\approx 10\hbar$), associated with the crossing of the TSD and highly deformed bands, is consistent with that expected for a band crossing based on the alignment of a pair of high-j intruder orbitals with a weak interaction strength. In agreement, lifetime measurements [3] show that the TSD band has a larger quadrupole moment than that of the highly deformed band to which it decays. This larger quadrupole moment is also consistent with the expected increase in deformation associated with the alignment of a pair of intruder orbitals. These results indicate that pairing correlations are still important up to spin 79/2 for the TSD bands in the mass 170 region. In addition, since this triaxial superdeformed band in ^{175}Hf is isospectral with the known TSD band 1 in ^{174}Hf [4], it is likely that these two bands are based upon similar configurations and deformations. These results, therefore, have implications for the interpretation of the other “floating” TSD bands in the Hf nuclei and the role of shape-driving high-j orbitals in the development of triaxial shapes.

[1] F.G. Kondev *et al.*, *to be published* (2004).

[2] N.L. Gjørup, Ph.D. thesis, University of Copenhagen, N.B.I., Denmark, (1994).

[3] M.K. Djongolov *et al.*, *to be published* (2004).

[4] M.K. Djongolov *et al.*, Phys. Lett. B **560**, 24 (2003).